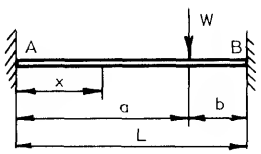
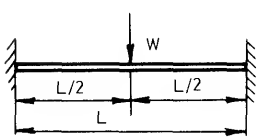
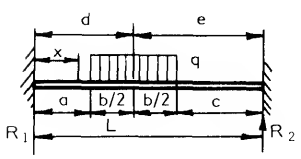
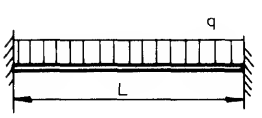
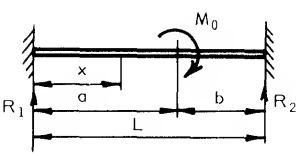
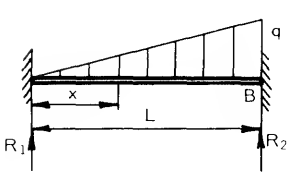
Table 23.2 Maximum Moments and Deflections for Built-In Beams

	Maximum Bending Moment	Maximum Deflection Due to Bending
	For $a < b$ $M_A = \dfrac{Wab^2}{L^2}$ For $a > b$ $M_B = \dfrac{Wa^2b}{L^2}$	For $a < b$ and $x = \dfrac{2Lb}{L+2b}$ $Y_B = \dfrac{2Wa^2b^3}{3EI(L+2b)^2}$ For $a > b$ and $x = \dfrac{2La}{L+2a}$ $Y_B = \dfrac{2Wa^3b^2}{3EI(L+2a)^2}$
	$M = \dfrac{WL}{8}$	$Y_B = \dfrac{WL^3}{192EI}$
	$R_1 = \dfrac{qb}{4L^3} \times [4e^2(L+2d) - b^2(c-a)]$ $M_1 = \dfrac{qb}{24L^2} \times \{b^2[L+3(c-a)] - 24e^2d\}$	For $0 < x < a$ $Y_b = \dfrac{3M_1x^2 + R_1x^3}{6EI}$ For $a < x < (a+b)$ $Y_B = \dfrac{12M_1x^2 + 4R_1x^3 - q(x-a)^4}{24EI}$
	$M = -\dfrac{qL^2}{12}$	$Y_B = \dfrac{qL^4}{384EI}$
	$R_1 = -\dfrac{6M_0ab}{L^3}$ $M_1 = -\dfrac{M_0b(L-3a)}{L^2}$ $M_2 = -\dfrac{M_0a(2L-3a)}{L^2}$ $R_2 = -R_1$	For $x = -\dfrac{2M_1}{R_1}$ and $a > \dfrac{L}{3}$ $Y_B = \dfrac{2M_1^3}{3EIR_1^2}$ For $x = L + \dfrac{2M_2}{R_2}$ and $a < 2\dfrac{L}{3}$ $Y_B = \dfrac{2M_2^3}{3EIR_2^2}$
	$R_1 = \dfrac{3qL}{20}$ $R_2 = \dfrac{7qL}{20}$ $M_B = \dfrac{qL^2}{20}$ (maximum)	$Y_B = \dfrac{qL^4}{764EI}$ (maximum) at $x = 0.525L$